

**ABSTRACT**

An apparatus and method for forming catalyst particles to grow nanotubes is disclosed. In addition, an apparatus and method for forming nanotubes using the catalytic particles is also disclosed. The particles formed may have different diameters depending upon how they are formed. Once formed, the particles are deposited on a substrate. Once deposited, the mobility of the particles is restricted and nanotubes and/or nanotube portions are grown on the particles. Nanotube portions having different diameters may be formed and the portions may be connected to form nanotubes with different diameters along the length of the nanotube.